

(12) **UK Patent Application** (19) **GB** (11) **2 224 969 A** (13)
(43) Date of publication 23.05.1990

(21) Application No 8821268.3

(22) Date of filing 12.09.1988

(71) Applicant
Tetronel Limited
Off Oak Road, Fountain Street, Morley, West Yorkshire,
United Kingdom

(72) Inventors
Roy Halpin
Christine Verna Halpin

(74) Agent and/or Address for Service
Urquhart-Dykes & Lord
5th Floor, Tower House, Merrion Way, Leeds,
West Yorkshire, LS2 8PA, United Kingdom

(51) INT CL⁴
B29C 41/22

(52) UK CL (Edition J)
B5A AT12P A1R214F A1R214H A1R314C6 A1R455
E1D DCF2 DF151 DLERB2 D1072 D401 D405

(56) Documents cited
GB 1524896 A GB 1415408 A GB 1250075 A
GB 1228996 A GB 1221267 A WO 81/02278 A1

(58) Field of search
UK CL (Edition J) B5A AT12P
INT CL⁴ B29C

(54) Improvements in and relating to the manufacture of laminates

(57) There is disclosed a method of manufacturing a laminate which comprises laying in a mould (1) a first layer (2) of a curable polyester resin, applying a second layer (3) in the form of a sheet of fibre matting, applying on top of the second layer (3) a third layer (4) which comprises a core material, applying on top of the third layer (4) a fourth layer (5) which comprises a further sheet of fibre matting which is arranged so as to enclose the core material (4) between the two sheets (3, 5) of fibre matting, bonding the first, second, third and fourth layers (2, 3, 4, 5) together using a hardenable resin-based material, and allowing the laminate to cure and removing it from the mould (1). The laminate may be provided with a textured finish so as to represent stonework, brickwork or the like so as to be used as part of a building or for cladding a building.

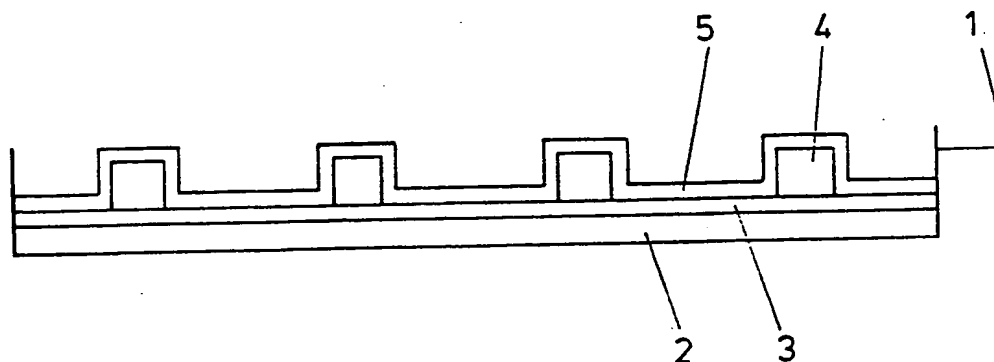


FIG. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

1/1

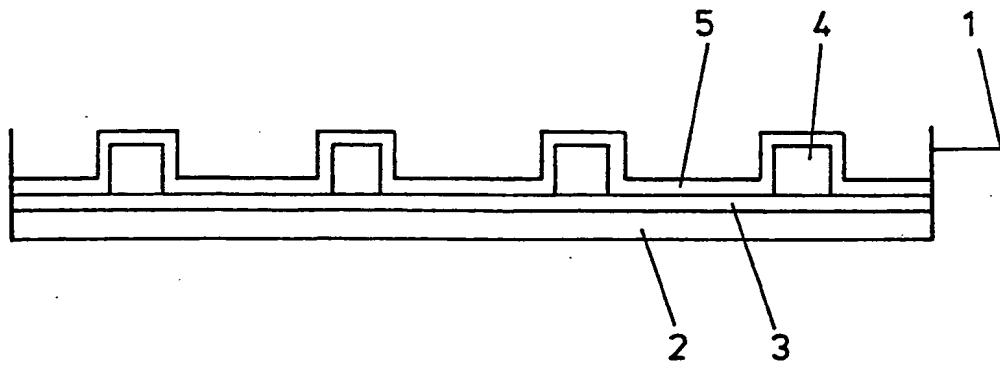


FIG. 1

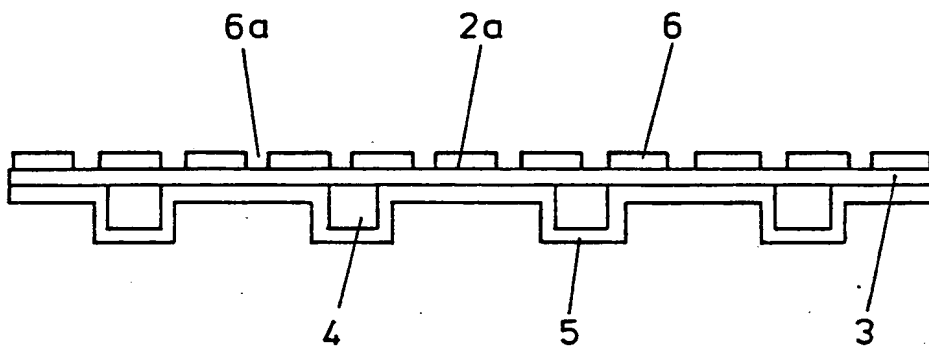


FIG. 2

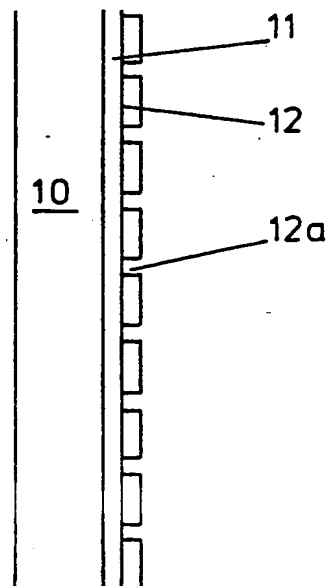


FIG. 3

IMPROVEMENTS IN AND RELATING TO THE MANUFACTURE OF LAMINATES

The present invention relates to an improved laminate and method of manufacturing the same, and particularly, though not exclusively, to such a laminate intended to be used as part of a building or for cladding a building.

According to a first aspect of the present invention there is provided a method of manufacturing a laminate, the method comprising the steps of:-

Laying in a suitable mould a first layer of hardenable resin based material;

Placing on top of said first layer a second layer comprising a sheet of fibre matting;

Placing on top of said second layer a third layer comprising a core material;

Placing on top of said third layer a fourth layer comprising a further sheet of fibre matting arranged so as to enclose said core material between said two sheets of fibre matting;

Bonding said first, second, third and fourth layers together using a hardenable resin based material;

Allowing the laminate to cure and removing it from the mould.

Preferably, once removed from the mould the first layer of the laminate, i.e. the cured resin based material, is decorated by the addition of a textured finish such as to represent stonework, brickwork or the like.

This is conveniently achieved by applying masking tape to the exposed surface of the first layer in any desired pattern, and applying to the first layer, over the top of the masking tape, a hardenable textured material which preferably comprises a mixture of resin, hardener, sand and pigment. The masking tape is then removed prior to drying or curing of the textured finish.

Alternatively, a proprietary textured paint may be utilized to give a very similar effect.

In the preferred embodiment, the resin based material for the first layer is a substance known as "gel-coate" which is a polyester resin. This may be transparent, or may have a pigment added thereto to create the desired colour for the first layer.

A particularly pleasing effect is obtained when the colour of the first layer and the colour of the textured finish contrast with each other, for example grey for the first layer and red for the textured finish, resulting in a brickwork effect.

The fibre matting is preferably a glassfibre reinforced plastic (GRP) mat, and this is conveniently secured to the layer directly underneath by means of a suitable resin and hardener mixture to which fire retardant agents may be added. Where the gel-coate is transparent, the resin/hardener mixture used to secure the second layer to the first layer may have a pigment added so that the colour will show through the transparent first layer.

The core material will obviously vary according to the particular application of the laminate, and may comprise either a solid piece of hardboard, chipboard, wood or the like. Alternatively, for a lighter duty laminate, the core material may comprise a series of strips of suitable rigid or semi-rigid material to provide the necessary stiffness in the finished laminate.

According to a second aspect of the present invention, there is provided a laminate comprising a first layer of resin based material, a second layer of fibre matting, a third layer of core material and a fourth layer of fibre matting, all of said layers being bonded together by a hardenable resin based material.

When the laminate of the present invention has been removed from the mould, a plurality of such laminates may be used to form a building or other structure. The textured finish may be applied to the individual laminates, but is preferably applied after the laminates have been

assembled together to form the building.

Occasionally, it is necessary to apply a cladding to an existing building, and the invention has therefore been modified so as to supply this particular demand.

According to a third aspect of the present invention there is provided a method of cladding the walls of a building or other structure, the method comprising the steps of :-

Applying to said walls a first layer of hardenable resin based material;

Allowing said first layer to harden;

Applying to said first layer a mask in any desired pattern;

Applying to said first layer and said mask a second layer of hardenable resin based material;

Removing said mask prior to hardening of said second layer.

As previously, the second layer preferably comprises a mixture of resin, hardener, sand and pigment, and the first layer may comprise any suitable curable resin based material, for example liquid plastic floor covering to which colour and fire retardance may be added.

Embodiments of the present invention will now be described by way of example only with reference to the accompanying drawings in which:

Figure 1 shows the manufacture of a laminate in accordance with the first and second aspects of the present invention;

Figure 2 shows the application of a textured finish to the laminate of Figure 1;

Figure 3 shows the cladding of an existing building in accordance with a third aspect of the present invention.

Referring to the drawings, a method of manufacturing a laminate according to the first and second aspects of the present invention comprises laying in a suitable mould 1 a first layer 2 of a curable polyester resin such as "gel-

coate". Next, a sheet 3 of 450gm GRP mat is applied over the gel-coate using a resin/hardener mix including fire retardants. A series of rigid or semi-rigid formers 4 are then applied over the mat 3, and a further sheet 5 of 450gm GRP mat is placed over the first sheet 3 and the formers 4, using a resin/hardener mix to secure the sheet 5 to the sheet 3 and formers 4.

After allowing the laminate to cure, it is turned out of the mould and inverted as shown in Figure 2.

By applying masking tape (not shown) in a desired pattern to the top surface 2a of the gel-coate layer 2 and applying over the tape a hardenable textured material 6, an effect similar to brickwork or stonework may be achieved. The textured material 6 comprises a mixture of resin, hardener, sand and pigment, or alternatively a textured paint may be used.

Naturally, the masking tape is removed prior to curing or drying of the textured finish, so as to prevent the edges of the textured finish 6 being broken as the tape is removed.

The gel-coate material preferably includes a pigment which contrasts with the pigment in a textured finish, so as to provide a two colour effect in which the gel-coate layer is visible through the gaps 6a in the textured finish 6.

Referring to Figure 3, a method of cladding a wall of an existing building is illustrated. This comprises applying to the wall a first layer 11 of hardenable resin based material such as liquid plastic floor covering, to which fire retardants and pigment may be added. When cured, this layer 11 has masking tape (not shown) applied thereto in a desired pattern, and a textured finish 12 such as that described above is applied over the tape and the first layer 11, the tape then being removed prior to curing or drying of the textured finish 12. Again, the first layer 11 and the textured finish 12 are preferably in

contrasting colours so that the colour of layer 11 is visible through the gaps 12a in the differently coloured textured finish 12.

CLAIMS

1. A method manufacturing a laminate, the method comprising the steps of:
 - laying in a suitable mould a first layer of hardenable resin-based material;
 - placing on top of said first layer a second layer comprising a sheet of fibre matting;
 - placing on top of said second layer a third layer comprising a core material;
 - placing on top of said third layer a fourth layer comprising a further sheet of fibre matting arranged so as to enclose said core material between said two sheets of fibre matting;
 - bonding said first, second, third and fourth layers together using a hardenable resin-based material; and,
 - allowing the laminate to cure and removing it from the mould.
2. A method according to Claim 1, in which, after removal from the mould, the first layer of the laminate is decorated by the addition of a textured finish.
3. A method according to Claim 2, in which masking tape is applied to the exposed surface of the first layer in any desired pattern, and there is applied to the first layer, over the top of the masking tape, a hardenable textured material, and then the masking tape is removed prior to drying or curing of the textured finish.
4. A method according to Claim 3, in which the hardenable textured material comprises a mixture of resin, hardener, sand and pigment.
5. A method according to Claim 1, in which a proprietary textured paint is applied to the laminate.
6. A method according to any one of the preceding claims, in which the resin-based material for the first layer comprises a polyester resin.
7. A method according to any one of the preceding

claims, in which the first layer is coloured grey and the textured finish is coloured red; to produce a brickwork effect.

8. A method according to any one of the preceding claims, in which the fibre matting is a glass fibre reinforced plastic mat secured to the layer directly, underneath by means of a resin and hardener mixture to which fire retardent agents are added.

9. A method according to any one of the preceding claims, in which the core material comprises a solid piece of hardboard, chipboard, wood, or a series of strips of rigid or semi-rigid material.

10. A laminate comprising a first layer of a resin-based material, a second layer of fibre matting, a third layer of core material and a fourth layer of fibre matting, all of said layers being bonded together by a hardenable resin-based material.

11. A method of cladding the walls of a building or other structure, the method comprising the steps of:

applying to said walls a first layer of hardenable resin-based material;

allowing said first layer to harden;

applying to said first layer a mask in any desired pattern;

applying to said first layer and to said mask a second layer of hardenable resin-based material; and,

removing said mask prior to hardening of said second layer.

12. A method according to Claim 1 and substantially as hereinbefore described with reference to, and as shown in the accompanying drawings.

13. A laminate according to Claim 10 and substantially as hereinbefore described with reference to, and as shown in the accompanying drawings.